



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,248	02/17/2004	Michael Kozhevnikov	1-17-10	9662
22046 7590 11/25/2008 Docket Administrator - Room 2F-192 Alcatel-Lucent USA Inc. 600-700 Mountain Avenue Murray Hill, NJ 07974				
EXAMINER				
BLEVINS, JERRY M				
ART UNIT		PAPER NUMBER		
2883				
MAIL DATE		DELIVERY MODE		
11/25/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/780,248

Applicant(s)

KOZHEVNIKOV ET AL.

Examiner

JERRY BLEVINS

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/5508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed September 11, 2008 have been fully considered but they are not persuasive.

Specifically, examiner maintains that the explanation of the applicant's sieve/combiner found on page 8, line 35 – page 9, line 4 of the specification is more of a functional description rather than a definition, and as such, this description cannot be properly read into the claim language. While examiner is fully aware that applicant can serve as his own lexicographer, a careful reading of the specification reveals that applicant has not actually defined a sieve/combiner but has merely described it functionally. If applicant desires for the claimed invention to include this functional description for purposes of distinguishing the claimed invention over the prior art, examiner invites applicant to enter the description directly into the claim language itself. In fact, if applicant contends that this description already exists within the claim by virtue of incorporation, examiner sees no downside to explicitly articulating these limitations directly in the claims. Furthermore, there exists nothing that would prohibit applicant from amending the claims to include these functional limitations of the sieve/combiner. However, additionally, examiner maintains that the previously cited prior art reference to Turpin '917, US 2003/0128917, teaches splitting a WDM beam into various described wavelength unit beams each of which wavelength channels and can combine such various beams into one WDM beam (paragraph 71). Therefore, it would appear that the combination of previously cited prior art references to Graves, US 2003/0128917 and Turpin '917 substantially render obvious the functional description of a wavelength sieve/combiner found in applicant's specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 14, 17, 27-29, and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,606,427 to Graves et al. in view of US 2003/0128917 to Turpin et al., (Turpin '917).

Regarding claim 1, Graves teaches an apparatus (Figures 3 and 7), comprising: an array of optical fibers (column 13, line 62 – column 14, line 31 teaches that all internal connections of Figure 3 are made by way of optical fibers); at least one wavelength multiplexer / demultiplexer (system including elements 16, 20) that operates on discrete wavelength units (abstract and column 5, line 63 – column 6, line 7); and a first array of micro mirrors (48,50); wherein the optical wavelength multiplexer / demultiplexer is optically interposed between the array of optical fibers and the array of micro mirrors. Graves does not teach that the wavelength multiplexer / demultiplexer is a wavelength sieve / combiner which can split a WDM beam into various described wavelength unit beams each of which contain prescribed wavelength channels and can combine such various beams into one WDM beam. Turpin '917 teaches a wavelength sieve / combiner which can split a WDM beam into various described wavelength unit beams each of which contain prescribed wavelength channels and can combine such various beams

into one WDM beam (interleaver, paragraph 71). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the multiplexer / demultiplexer of Graves with the sieve / combiner of Turpin '917. The motivation would have been to improve bandwidth utilization and increase channel counts (paragraph 72).

Regarding claim 2, Graves teaches that any wavelength within one of the discrete wavelengths units is supplied to or received from the same beam position by the wavelength sieve/combiner (column 7, lines 21-46).

Regarding claim 3, Graves teaches an array of micro lenses (52,56), one micro lens for each optical fiber in the array of optical fibers, the micro lenses being optically interposed between the array of optical fibers and the wavelength sieve/combiner.

Regarding claim 4, Graves an array of collimators (52,56), one collimator for each optical fiber, each of said collimators being attached to one of the optical fibers, the collimators being optically interposed between the optical fibers and the wavelength sieve/combiner.

Regarding claims 5 and 6, Graves teaches a first focusing system (52,56) comprising a lens that focuses output beams from the wavelength sieve/combiner onto the first array of micro mirrors.

Regarding claim 14, Graves teaches a plurality of the wavelength sieve / combiners (Figure 3 shows a plurality of multiplexers/demultiplexers).

Regarding claim 17, Graves teaches at least one sensor (column 20, lines 25-56) for detecting light at least a prescribed one of the discrete wavelength units.

Regarding claims 27 and 28, Graves teaches that the apparatus is adapted to operate at least in part as a multiplexer and at least in part as a demultiplexer (abstract and column 5, lines 24-38)

Regarding claim 29, Graves teaches that the apparatus is adapted so that beams from the optical fibers are converging prior to encountering the at least one wavelength sieve/combiner (column 21, lines 9-50).

Regarding claim 31, Graves teaches an apparatus (Figures 3 and 7), comprising: a multiplexer/demultiplexer (system including elements 16 and 20); and an array of micro mirrors (48,50); wherein the sieve/combiner is optically interposed between the array of micro mirrors and an array of optical elements (fibers, column 13, line 62 – column 14, line 31 teaches that all internal connections of Figure 3 are made by way of optical fibers) at least one of which is adapted to supply an optical beam to the apparatus and at least one is adapted to receive an optical beam from the apparatus (the input and output connections are made by way of optical fibers as well). Graves does not teach that the wavelength multiplexer/demultiplexer is a wavelength sieve/combiner which can split a WDM beam into various described wavelength unit beams each of which contain prescribed wavelength channels and can combine such various beams into one WDM beam. Turpin '917 teaches a wavelength sieve/combiner which can split a WDM beam into various described wavelength unit beams each of which contain prescribed wavelength channels and can combine such various beams into one WDM beam (interleaver, paragraph 71). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the multiplexer/demultiplexer of Graves with the

sieve/combiner of Turpin '917. The motivation would have been to improve bandwidth utilization and increase channel counts (paragraph 72).

Regarding claims 32 and 34, Graves in view of Turpin '917 renders obvious the limitations of the base claims 1 and 31, respectively. Graves does not teach a free space path between the sieve/combiner and the first array of micro mirrors. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a free space path between the sieve/combiner and the first array of micro mirrors of Graves. The motivation would have been to reduce space due to elimination of fiber optics and reduce the associated costs thereof.

Regarding claims 33 and 35, Graves in view of Turpin '917 renders obvious the limitations of the base claims 32 and 34, respectively. Graves does not teach that the free space path includes a mirror, a lens, or a prism. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a mirror, a lens, or a prism in a free space path between the sieve/combiner and the first array of micro mirrors of Graves. The motivation would have been to increase the accuracy of the alignment of the free space path.

Claims 7 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917, as applied to claims 5 and 29 above, and further in view of US Patent to Hatano et al., number 6,721,099.

Regarding claim 7, Graves in view of Turpin '917 renders obvious the limitations of the base claim 5. Graves does not teach that the first focusing system comprises a prism, but rather teaches a lens (Figure 1A, element 102). Hatano teaches that prisms can be chosen instead of

lenses in order to obtain the same focusing effects (column 3, lines 11-16). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves by choosing a prism as the focusing system, as taught by Hatano. The motivation would have been to individually focus the discrete wavelength units.

Regarding claim 30, Graves in view of Turpin '917 renders obvious the limitations of the base claim 29. Graves does not teach that a prism optically interposed between the wavelength sieve/combiner and the array of micro mirrors, but rather teaches a lens (Figure 1A, element 102). Hatano teaches that prisms can be chosen instead of lenses in order to obtain the same focusing effects (column 3, lines 11-16). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves by choosing a prism as the focusing system, as taught by Hatano. The motivation would have been to individually focus the discrete wavelength units.

Claims 8-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917, as applied to claim 1 above, and further in view of in view of US Patent to Lee et al., number 6,269,202.

Regarding claim 8, Graves in view of Turpin '917 renders obvious the limitations of the base claim 1. Graves does not teach that the wavelength sieve/combiner comprises at least one thin film optical filter. Lee teaches that thin film optical filters can be chosen to serve as wavelength sieve/combiners (column 1, lines 48-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves by choosing a thin film

optical filter as the wavelength sieve/combiner, as taught by Lee. The motivation would have been to reduce loss and increase channel isolation (Lee, column 1, lines 50-53).

Regarding claims 9 and 10, Graves in view of Turpin '917 and further in view of Lee renders obvious the limitations of the base claim 8. Graves does not teach that the thin film optical filter is mounted on a glass substrate. Lee teaches that the thin film optical filter is mounted on a glass substrate (Figure 1A and column 3, line 66 – column 4, line 6). It would have been obvious to one of ordinary skill in the art to modify Graves with the thin film filter mounted on a glass substrate taught by Lee. The motivation would have been to improve stability of the filter.

Regarding claim 11, Graves in view of Turpin '917 and further in view of Lee renders obvious the limitations of the base claim 8. Graves also teaches that the wavelength sieve/combiner (replaced by a thin film filter as taught by Lee) is freespace suspended (column 21, lines 9-50).

Regarding claims 12 and 13, Graves in view of Turpin '917 and further in view of Lee renders obvious the limitations of the base claim 8. Graves also teaches that the wavelength sieve/combiner (replaced by a thin film filter as taught by Lee) passes a portion of all (which includes the subset of some) of the wavelengths incident upon it and reflects a portion of all (which includes the subset of some) of the wavelengths incident upon it, whereby a copy of the incident wavelengths (that a portion is passed for) is created (column 21, line 51 – column 22, line 10).

Regarding claim 15, Graves in view of Turpin '917 renders obvious the limitations of the base claim 1. Graves does not teach that there is a plurality of the wavelength sieve/combiners

and each of the wavelength sieve/combiners is formed from respective portions of a plurality of strips of thin film optical filters. Lee teaches that thin film optical filters can be chosen to serve as wavelength sieve/combiners (column 1, lines 48-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves by choosing a thin film optical filter as the wavelength sieve/combiner, as taught by Lee. The motivation would have been to reduce loss and increase channel isolation (Lee, column 1, lines 50-53). Graves also does not teach a plurality of wavelength sieve/combiners. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a plurality of the wavelength sieve/combiners since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. The motivation would have been to improve coupling between the plurality of fibers and the plurality of micro mirrors.

Regarding claim 16, Graves in view of Turpin '917 renders obvious the limitations of the base claim 1. Graves also teaches that the at least one wavelength sieve / combiners is adapted to supply as output one beam for a discrete wavelength unit (column 4, lines 13-20). Graves does not teach a plurality of strips of thin film optical filter incorporated in the wavelength sieve/combiner. Lee teaches that thin film optical filters can be chosen to serve as wavelength sieve/combiners (column 1, lines 48-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves by choosing a thin film optical filter as the wavelength sieve/combiner, as taught by Lee. The motivation would have been to reduce loss and increase channel isolation (Lee, column 1, lines 50-53). Graves also does not teach a plurality of strips of thin film optical filters. However, it would have been obvious to one of

ordinary skill in the art at the time of the invention to provide a plurality of strips of thin film optical filters since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. The motivation would have been to improve coupling between the plurality of fibers and the plurality of micro mirrors.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917 as applied to claim 17 above, and further in view of US Pre Grant Publication to Brennan, III et al., number 2003/0059195.

Regarding claim 18, Graves in view of Turpin '917 renders obvious the limitations of the base claim 17. Graves does not teach that the at least one sensor is mounted on the at least one wavelength sieve/combiner. Brennan teaches mounting a sensor on a wavelength sieve/combiner (pages 5 and 6, paragraphs 65 and 66). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves with a sensor mounted on a wavelength sieve/combiner as taught by Brennan. The motivation would have been to simplify manufacturing and reduce costs (Brennan, pages 5 and 6, paragraphs 65 and 66).

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917 as applied to claim 1 above, and further in view of US Pre Grant Publication to Mala et al., number 2003/0223679.

Regarding claims 19 and 20, Graves in view of Turpin '917 renders obvious the limitations of the base claim 1. Graves does not teach that at least one micro mirror of the array

of micro mirrors can tilt around two axes, wherein each of the two axes are substantially orthogonal to the other. Mala teaches micro mirrors which can tilt around two orthogonal axes (abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves with the micro mirrors which can tilt around two orthogonal axes as taught by Mala. The motivation would have been to increase the degrees of freedom of the micro mirrors.

Claims 21-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917 as applied to claims 1 and 5 above, and further in view of US Pre Grant Publication to Wu et al., number 2005/0213877.

Regarding claims 21-23, Graves in view of Turpin '917 renders obvious the limitations of the base claims 1 and 5. Graves does not teach a second array of micro mirrors; wherein the optical wavelength sieve/combiner is also optically interposed between the array of optical fibers and the second array of micro mirrors; and a second focusing system that focuses output beams from the wavelength sieve/combiner onto the second array of micro mirrors. Wu teaches a second array of micro mirrors (Figure 3, element 108, as compared to first array of micro mirrors, element 104); wherein a wavelength sieve/combiner (grating 16) is optically interposed between an array of fibers (56) and both the first and second arrays of micro mirrors and a second focusing system (Figure 3, element 20b as compared to first focusing system 20a) that focuses output beams from the wavelength sieve/combiner onto the second array of micro mirrors. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves with the second array of micro mirrors and second focusing system

of Wu. The motivation would have been to increase the number of input/output fibers (Wu, page 1, paragraphs 10 and 11).

Regarding claim 25, Graves in view of Turpin '917 and further in view of Wu teaches the limitations of the base claim 23. Graves does not teach first and second focusing systems which are the same. Wu teaches that the first and the second focusing system are the same (they are both a lens). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves with the two same focusing systems taught by Wu. The motivation would have been to ease alignment of the focusing systems.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917 and further in view of Wu as applied to claim 23 above, and further in view of Hatano.

Regarding claim 24, Graves in view of Turpin '917 and further in view of Wu renders obvious the limitations of the base claim 23. Graves does not teach that the first and the second focusing system are different. Hatano teaches that prisms can be chosen instead of lenses in order to obtain the same focusing effects (column 3, lines 11-16), implicitly teaching that one focusing system can be chosen to be a lens (as taught by Graves) while the other can be chosen to be a prism. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves with the different focusing systems as implicitly taught by Hatano. The motivation would have been to improve distinction between output and input wavelengths.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Turpin '917 as applied to claim 1 above, and further in view of US Pre Grant Publication to Turpin et al., number 2003/0021525 (Turpin '525).

Regarding claim 26, Graves in view of Turpin '917 renders obvious the limitations of the base claim 1. Graves does not teach that the apparatus is adapted to operate in broadcast mode. Turpin '525 teaches an apparatus utilizing a wavelength sieve/combiner, which can be adapted to operate in broadcast mode (Figures 5 and 6 and page 4, paragraph 50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Graves so as to be adapted for broadcast mode, as taught by Turpin '525. The motivation would have been to increase the amount of information transferred by the apparatus.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BLEVINS whose telephone number is (571)272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry M Blevins/
Patent Examiner, Art Unit 2883

/Frank G Font/
Supervisory Patent Examiner, Art Unit 2883

FGF/jmb
11/17/2008